

SECOND SITE INSPECTION REPORT (SI2)

EISENBERG FILL SITE ALIAS: LEO EISENBERG'S PROPERTY

CLAY COUNTY, MISSOURI

30808321



Superfund

August 7, 1995

Missouri Department of Natural Resources

Hazardous Waste Program

Site:	Leo Eisenberg
ID #:	MOD988-7681-95
Break:	1.5
Other:	8-7-95



Prepared By

Julie A. Bloss

Julie A. Bloss
Environmental
Specialist

Reviewed By

Julie Warren

Julie Warren
Acting Chief
Site Evaluation Unit

Approved By

Gary T. Behrns

Gary T. Behrns
Chief
Superfund Section

DATE: August 7, 1995

PREPARED BY: Julie A. Bloss
Missouri Department of Natural Resources

SITE: Eisenberg Fill site (alias: Leo Eisenbergs Property)

EPA ID NO: MOD985768175

CA. NO: V007587-03-0

1. INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the Missouri Hazardous Waste Management Law (1986), the Missouri Department of Natural Resources (MDNR), Hazardous Waste Program (HWP) conducted a second site inspection (SI2) at Leo Eisenbergs Property, which is also known as the Eisenberg Fill site. This report was prepared by MDNR under a cooperative agreement with EPA for fiscal year 1995.

The purpose of this investigation was to collect sufficient information concerning conditions at the site to assess the threat posed to human health and the environment and to determine the need for additional investigation under CERCLA/SARA or other authority. The scope of the investigation included review of previous file information, sampling of waste and environmental media to test previous preliminary assessment and site inspection (PA/SI) hypotheses and document HRS (Hazard Ranking System) factors, and to collect additional non-sampling information.

The Eisenberg Fill site is listed under the CERCLA Information System (CERCLIS), as Leo Eisenberg's Property. The site is listed as having been discovered on February 8, 1989 by EPA with a PA conducted in 1989, although initial EPA sampling was conducted in 1988. MDNR conducted SI sampling in 1989 and completed the SI report in 1990. The SI is listed on CERCLIS with a completion date of 1991. Due to an inaccuracy in the SI sampling map, there was some confusion as to the exact location of the site. A second site inspection was performed to document the exact location of the site as well as to update the site's status. Site visits were conducted by MDNR staff on June 3, 1993 and June 2, 1994. An SI2 site reconnaissance and sampling event were conducted by MDNR on April 27, 1995.

2. SITE DESCRIPTION, OPERATIONAL HISTORY, AND WASTE CHARACTERISTICS

2.1 Location

The Eisenberg Fill site is located on the eastern side of Interstate-35 and north of 16th street in North Kansas City, Missouri. This location is in the center of the Southwest Quarter (SW ¼) of the Southwest Quarter (SW ¼) of Section 13, Township 50 North (T50N), Range 33 West (R33W), in Clay County, Missouri (Reference 4). The geographical coordinates are 39° 8' 19.30" north latitude and 94° 33' 42.93" west longitude (Reference 3). To reach the site from Kansas City, take I-35 north to the exit at 16th Street. Follow 16th Street east until it dead-ends at Railroad Avenue. The site is located to the north along Railroad Avenue (Reference 4).

Climatically, the Kansas City area is characterized by warm, humid summers and cold winters. Within a season, temperatures and precipitation may fluctuate widely. Summer weather is moderately warm and humid. July and August temperatures occasionally exceed 100° Fahrenheit (F). The average annual temperature is about 55° (Reference 11, p.4-5). The average annual rainfall for Clay County is about 36 inches. Rainfall is highest in June (Reference 11, p.4-5).

2.2 Site Description

The Eisenberg property is an undeveloped 30-acre tract located in an industrialized portion of North Kansas City, Missouri. The property is diamond-shaped. It is bound to the north and west by I-35, and to the east and south by railroad tracks and the Burlington Northern railyard (Figure 1). ConAgra and another flour milling company are located northeast of the property, facing Armour Road (References 4; 10; 13; photo #46-15A). The southwestern 10 acres of the property, currently leased to Mo-Kan Container Service, is the portion of the property which was the focus of previous site investigations. For purposes of this report, the Eisenberg Fill site consists of the entire 30-acre tract.

Mo-Kan Container Service is a company that rents containers for use by truck or rail (Reference 6; photo #46-18A). This company was not operating on-site prior to June 1993, when MDNR conducted a site visit (Reference 18). When MDNR returned to the site in 1994, truck/rail containers were present on-site. There were areas of new gravel and recent grading between the containers (Reference 5, p.2).

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The Mo-Kan rental area was completely covered with truck/rail containers at the time of the MDNR SI2 site visit. A check-in trailer is located at the entrance to Mo-Kan (Reference 13). The northeastern 20 acres of the property is vacant, primarily covered with sparse vegetation. Heavier vegetation occurs along the intermittent drainages running along the northern and western boundaries. A strip of heavier vegetation also separates Mo-Kan from the vacant portion of the property (Reference 13, photo #46-16A).

The City of North Kansas City 19th Avenue pumping station is located slightly east/southeast of the property (photo #46-7A). This pump station serves to lift sewage so that it can flow down hill to the sewage disposal area, located slightly less than one mile to the northeast of the site (References 4; 27). The pump station building formerly housed an animal shelter. An intermittent drainage runs behind the southeastern corner of this building (Reference 13).

2.3 Site History

On April 6, 1988, the Emergency Planning and Response Branch of EPA Region VII received a call from the North Kansas City Fire Department reporting several pools of an unknown liquid oozing from a fill area near the intersection of 16th Street and Interstate 35. A subsequent investigation by EPA revealed three pools of dark stained water, each approximately 50 square feet in size, at the northeastern corner of what is now Mo-Kan rental property. A sample of the pooled water was collected by EPA on April 6, 1988 and analyzed for metals and organic pollutants (Reference 5, p.1; Reference 9, p.1). This information was used by EPA to complete a PA form (Reference 9).

MDNR continued investigations of the Eisenberg Fill site and conducted sampling in support of the first SI on July 25, 1989. Two small shallow pools, approximately six feet in diameter and five or six inches deep were observed at that time. Both pools contained a chocolate-brown colored water. The presence of the pools seemed unusual considering that there had not been any recent rainfall and the area largely consisted of rock and gravel fill (Reference 7). A sample of pooled water was collected, along with a sample of the fill material underlying the pool. A sample of fill was collected from a location 50 feet south, as a background (Reference 7).

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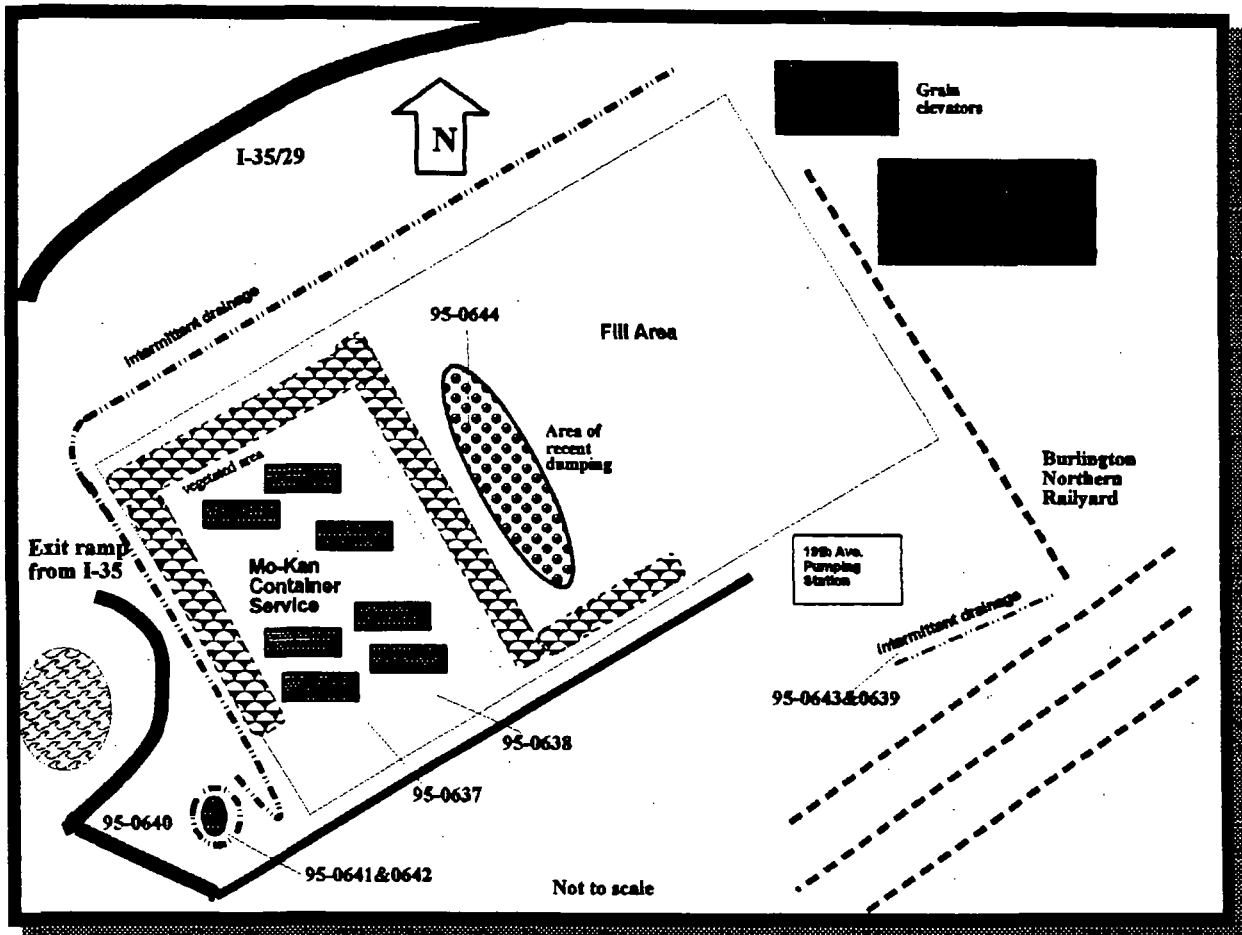


Figure 1 - Eisenberg Fill Site Map With SI2 Sampling Locations

The site appears to have been used as a fill area for at least seven years, based upon the time the original complaint was filed (1988) and subsequent observations of dumping. In 1993, an employee of the animal shelter said that there had been a lot of hauling to the site in the last couple of years (Reference 18). A city employee who inspects the 19th Avenue pumping station has observed people hauling fill dirt and chunks of concrete to the site, but had not observed any unusual loads that would indicate something hazardous has been placed there (Reference 27).

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An area of recent dumping was observed during the MDNR on-site sampling on April 27, 1995 (Reference 13; location is marked in Figure 1). The material appeared to be a type of sludge (photo #46-17A). A sample of this material was collected from a pile similar to the one depicted in #46-17A, for analysis. Piles of this grayish, sludge-like material were observed to be scattered across the northern 20 acres of the Eisenberg property. (Reference 44).

The Eisenberg property is owned by Northtown Devco, a Missouri General Partnership of the County of Jackson, State of Missouri. Their mailing address is in care of Leo Eisenberg & Co., Inc. in Kansas City, Missouri (Reference 18).

2.4 Waste Characteristics

The following hazardous wastes are known to be associated with the Eisenberg Fill site:

► *Arsenic* (Reference 20, p.1-4)

Arsenic is a naturally occurring metal used in copper and lead smelting, wood treating and pesticide application. Inorganic arsenic is recognized as a human poison, with doses of 300 ppb in food or water resulting in death. EPA has classified arsenic as a known human carcinogen.

► *Cadmium* (Reference 46, p.1-5, 89-90)

Cadmium is a naturally occurring metal commonly found as a mineral combined with other elements such as oxygen and sulfur. Most cadmium used in this country is extracted during the production of other metals such as zinc, lead, or copper. Cadmium has many uses in industry and consumer products, mainly batteries, pigments, metal coatings, and plastics. Food and cigarette smoke are the largest potential sources of cadmium exposure for most people.

Most of the cadmium that enters the environment binds to soil, but it can leach into groundwater under acidic conditions. Cadmium is more mobile in aquatic environments than most other heavy metals, such as lead. Aquatic and terrestrial organisms bioaccumulate cadmium.

Cadmium has no known health benefits. Excessive levels of acute cadmium exposure can irritate the stomach and digestive tract, and may lead to death. In the human body, cadmium is stored in the liver and kidneys. Long-term exposure to cadmium can cause

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fragile bones and kidney damage. EPA has determined that cadmium is a probable human carcinogen via inhalation.

► *Lead* (Reference 45, p. 1-6).

Lead is a naturally-occurring, bluish-gray element. Although its abundance in the earth's crust is small, human activities have dispersed lead throughout the environment. Lead has been used to produce batteries, ammunition, piping, paints and ceramic glazes. Tetraethyl and tetramethyl lead were formerly used as gasoline additives.

Human exposure to lead can have adverse effects on such tissues as the heart, kidneys, lungs, and brain. These effects are more striking in children. Nearly all of the lead entering the bloodstream of an adult will move into bones and teeth within a few weeks. In children, however, over 25% of the lead remains in their soft tissues.

Lead exposure can cause poor growth and decreased mental ability in an unborn child. Similar effects can occur in young children. At high levels of exposure, lead can severely damage the brain and kidneys of both adults and children. Lower levels of lead exposure contribute to slower reaction time, poor memory, and weakness in the extremities. Some lead compounds may be carcinogenic, but have not been classified as such at this time.

► *Selenium* (Reference 47, p.1-9)

Selenium is a naturally occurring element commonly found combined with sulfide minerals or with copper, silver, lead, and nickel minerals. The burning of coal, especially the fly ash that comes from burning coal, is the major source of selenium in the environment. Elemental selenium is also commercially processed, primarily as a by-product of copper refining.

Some evidence indicates that selenium can bioaccumulate and possibly biomagnify in aquatic organisms. Exposure to high levels of inorganic selenium has been shown to cause birth defects in birds, but not in mammals.

Most of the selenium that enters the human body is excreted within 24 hours. A small amount of selenium is recommended in the human diet. Ingestion of slightly higher levels of selenium can cause adverse effects such as brittle hair, deformed nails, and loss of feeling in the extremities. Dizziness, fatigue, and irritation of mucous membranes have been reported in occupational exposures to selenium dust. EPA has classified one form of selenium, selenium sulfide, as a probable human carcinogen.

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► *Vanadium* (Reference 19, p.1-2,50)

Vanadium occurs naturally in fuel oils and coal, and can be released to the environment when fuel oil is burned. Vanadium is used in the processes of making steel, rubber, plastics, and ceramics. Approximately 83% of the vanadium used in the United States is utilized as an alloying agent in the steel industry; 14% in the production of ferrovanadium alloys, which are used in the manufacture of jet aircraft engines. Vanadium dusts are known to cause irritation to the eyes, throat, and lungs. Vanadium is not known to be a human carcinogen.

► *Polycyclic Aromatic Hydrocarbons (PAHs)* (Reference 21, p.1-4)

PAHs are a group of chemicals that are formed during the incomplete burning of coal and other organic substances. A few PAHs are used to prepare medicines, dyes, plastics and pesticides; others are contained in asphalt used in road construction. EPA has determined that seven PAHs (benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene) are probable human carcinogens. Negative immunologic effects have been reported in animals.

3. WASTE/SOURCE SAMPLING

3.1 Sampling Locations

Previous Site Sampling

A sample of pooled water was collected by EPA on April 6, 1988 from the area now occupied by Mo-Kan. This sample was analyzed for metals and organic pollutants (Reference 5, p.1; 9, p.1).

Two samples, a water grab and a grab of underlying fill, were collected by MDNR from the pooled water area on July 25, 1989 during SI1 sampling. Another grab of fill was collected for use as a background sample from a location 50 feet south. These samples were analyzed for volatile organics, base neutrals, and metals (References 5; 7).

SI2 Sampling

MDNR conducted SI2 sampling on April 27, 1995. The pooled waste was not observed during this visit (Reference 13). The former location of the pools has been buried by greater than three feet of fill and is occupied by Mo-Kan Container Service and their fleet of truck/rail containers. Soil samples, 95-0637 and 95-0638, were collected from the

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former pooled waste area. These results are discussed under Section 6, Soil Exposure and Air Pathways. Sample 95-0644 was collected from a grayish pile of sludge like material, similar in composition to the material depicted in photo #46-17A (Reference 18, p.3). A background sample was collected from an area near the off ramp from I-35.

SI2 sampling rationale is presented as Appendix A. SI2 sampling locations are shown in Figure 1.

3.2 Analytical Results

► *EPA Sampling - April 6, 1988*

Analytical results for the surface water source sample collected by EPA are presented in Table 1a. Several metals were detected in excess of the environmental benchmarks listed for surface water in the Superfund Chemical Data Matrix (SCDM): arsenic (4.4 parts per million or ppm), chromium (0.5 ppm), copper (5.5 ppm), iron (43,000 ppm), nickel (5 ppm), lead (0.2 ppm), and zinc (0.6 ppm). Vanadium (100 ppm) was also detected. Results for semi-volatile compounds were inconclusive (References 2; 9).

► *MDNR SI1 Sampling - July 25, 1989*

The sample of underlying fill from the pooled water area detected vanadium and the following base neutral compounds in excess of three times the background sample: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(ghi)perylene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene. The levels of benzo(a)pyrene in both the background sample (0.8 ppm) and the pooled area sample (3.8 ppm) are in excess of the SCDM benchmark for benzo(a)pyrene in soil (0.08 ppm). Five additional base neutral compounds were detected in the fill sample collected 50 feet south, indicating that the extent of contamination on-site may not be limited to the observed contamination in the pooled water area (References 5, 7; Table 1B).

The following metals were detected in the pooled water sample in excess of SCDM environmental benchmarks for surface water: silver (0.07 ppm), cadmium (0.6 ppm), mercury (0.7 ppm), and lead (0.2 ppm). Vanadium was also detected (1.9 ppm) (References 2; 5; 7).

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► *MDNR SI2 Sampling - April 27, 1995*

The following base/neutral/acid extractable compounds were detected in the sludge-like material at levels elevated above background: naphthalene (0.035 ppm), 2-methylnaphthalene (0.082 ppm), dibenzofuran (0.024 ppm), and phenanthrene (0.086 ppm). Selenium (total) was also detected in this sample at 2.79 ppm; this metal was not detected in any soil samples collected from this site. Arsenic (total) was detected at 6.18 ppm, which is above the SCDM benchmark for arsenic (0.33 ppm), but this metal was detected at similar levels (10.5 ppm) in the background sample (Reference 44; Table 1C).

3.3 Conclusions

Previous on-site sampling found hazardous substances in the soils and pooled water of the Eisenberg Fill site in the vicinity of the current Mo-Kan operation. Levels of benzo(a)pyrene were detected in on-site soils in 1989 in excess of site screening standards; other polycyclic aromatic hydrocarbons were present. Levels of vanadium (100 ppm) and arsenic (4.4 ppm) in pooled water on-site exceeded expected concentrations for surface water (up to 0.2 ppm vanadium; about 0.002 ppm arsenic) (Reference 19, p.63; 20, p.2).

SI2 sampling conducted in April 1995 indicates that the contamination of this property extends beyond the 10 acres of Mo-Kan rental property and includes portions of the 20 acre vacant lot. Levels of selenium and several semi-volatile compounds in the sample of sludge-like material were found to exceed the background sample, which was non-detect for these parameters. Arsenic was detected at a level which exceeds the SCDM benchmark for arsenic but this metal was also found in the background sample (References 2;44). Arsenic is commonly found in soils in Missouri at levels ranging up to 70 ppm; the average amount of arsenic in Missouri soils is 8.7 ppm (Reference 26, p.H13).

The background sample is likely to be influenced by its proximity to the highway, which may account for some of the PAH contamination detected (such as pyrene and fluoranthene), as these compounds are commonly associated with incomplete burning of fuel (Reference 21, p.2). An elevated level of vanadium was found in the suspected source sample (209 ppm), although this value is not greater than three times background. The expected level of naturally-occurring vanadium in soils in this area is up to 125 ppm (up to 150 ppm nationally); the background sample detected 142 ppm, which is higher than anticipated (Reference 19, p.2; 26, p.H50; 44).

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Table 1A PREVIOUS SAMPLING CONDUCTED AT EISENBERG FILL SITE - PA STAGE U.S. ENVIRONMENTAL PROTECTION AGENCY - APRIL 6, 1988 Shaded values exceed a SCDM benchmark; All results in parts per billion (ppb)		
PARAMETER	Pooled Water PK825001	SCDM Environmental Benchmark - Surface Water
Aluminum	28,000	—
Arsenic	4,400	190
Barium	740	—
Cobalt	150	—
Chromium	500	210
Copper	5,500	12
Iron	43,000	1,000
Manganese	1,800	—
Molybdenum	1,700	—
Nickel	5,000	160
Lead	190	3.2
Titanium	870	—
Vanadium	100,000	—
Zinc	610	110
Calcium	150	—
Sodium	10,000	—

— indicates substance was either not present or present below detection levels.

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Table 1B

PREVIOUS SAMPLING CONDUCTED AT EISENBERG FILL SITE - SI1 SAMPLING MISSOURI DEPARTMENT OF NATURAL RESOURCES - JULY 25, 1989 Shaded values exceed applicable SCDM benchmark; All results in parts per billion. (ppb)					
PARAMETER	89-1736 POOLED WATER AREA - soil	89-1737 UPGRADIENT of 89-1736 -soil	89-1738 POOLED WATER	SCDM soil value	SCDM surface water value
Silver	170	72	7.1	2,900,000	0.12
Barium	140000	200000	600	41,000,000	—
Cadmium	3600	2300	57	290,000	1.1
Chromium	10000	12000	170	2,900,000	210
Mercury	1500	850	690	170,000	0.012
Lead	84000	38000	180	—	0.08
Selenium	200	120	15	2,900,000	36
Vanadium	85000	17000	1900	4,100,000	—
Benzo(a)anthracene	3800	—	—	—	—
Benzo(a)pyrene	3800	800	—	80	—
Benzo(b)fluoranthene	7400	700	—	—	—
Benzo(ghi)perylene	3500	—	—	—	—
Bis(2-ethylhexyl)phthalate	600	600	37	42,000	—
Chrysene	5100	600	—	—	—
Fluoranthene	7600	800	—	23,000,000	—
Indeno(1,2,3-cd)pyrene	3000	—	—	—	—
Phenanthrene	3900	—	—	—	—
Pyrene	9500	700	—	17,000,000	—

— indicates substance not present or present below detection levels. No VOAs were detected.

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Table 1C

MISSOURI DEPARTMENT OF NATURAL RESOURCES SECOND SITE INSPECTION (SI2) SAMPLING EISENBERG FILL SITE - SOURCE MATERIAL RESULTS (0-2 foot depth) Samples collected April 27, 1995; All samples in parts per million (ppm) Values in bold show actual contamination*; shaded values exceed an applicable SCDM benchmark			
PARAMETER	Sample Number and Type		
Samples analyzed for total metals and BNAs	SCDM Reference Value	95-0640 - Soil grab, near exit ramp; Soil Background	95-0644 - "Soil" grab, north side of Mo-Kan fill; suspected source
Arsenic, total	0.33	10.5	6.18
Barium, total	41,000	241	25.9
Cadmium, total	290	1.03	ND
Chromium, total	2,900	19.8	33.5
Lead, total	---	32.5	14.3
Selenium, total	2,900	ND	2.79
Vanadium, total	4,100	142	209
Naphthalene	---	ND	0.035
2-Methylnaphthalene	---	ND	0.082
Dibenzofuran	---	ND	0.024
Phenanthrene	---	ND	0.086
Fluoranthene	23,000	0.1	ND
Pyrene	17,000	0.073	ND
* - Values exceed background if background is non-detect (ND) or are 3X background			

4. GROUNDWATER PATHWAY

4.1 Hydrogeologic Setting

The Eisenberg Fill site is located in an industrialized section of North Kansas City, Missouri, in the Missouri River floodplain. The topographic surface of the floodplain in this area is nearly level (References 4; 8, p.1).

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The Missouri River alluvium covers approximately 150 square miles through the Kansas City area and is the major aquifer in northwestern Missouri (Reference 8, p.2; 10, p.1). Large quantities of water (1,000 to 2,000 gallons per minute) are obtainable from the saturated sand and gravel of the alluvium. Groundwater in the alluvial aquifer occurs under both unconfined and artesian conditions (Reference 8, p.2; 12, p.24).

Depth to the alluvial aquifer is estimated at 15 to 30 feet below ground surface. It is expected that the thickness of the alluvial material above bedrock is in the range of 70 to 140 feet, averaging 85 to 90 feet. The composition of the alluvium varies from highly permeable coarse sand and gravel to finer sand. Variations in the thickness of the alluvium is controlled by irregularities in the bedrock surface (Reference 8, p.1-2).

The dominant regional groundwater flow direction is toward the south, but the direction in the alluvial aquifer may vary, depending upon the magnitude of flow in the Missouri River (Reference 8, p.1). During flooding or exceptionally high river stages, the river can recharge the aquifer and redirect the flow eastward (Reference 17, p.1).

Bedrock in this area is a slightly permeable shale, likely of the Pennsylvanian aged Pleasanton group. The Pleasanton is estimated to be 30 to 80 feet thick in this area. This shale unit would be expected to act as an aquitard (Reference 8, p.1; 17, p.1). Deep bedrock groundwater in Pennsylvanian-aged rock is highly mineralized and is non-potable (Reference 8, p.2). In addition to poor water quality, yields from the bedrock aquifer would likely be too low for most uses (Reference 12, p.24).

The Kansas City area is under evaluation for a wellhead protection program (WHPP), but this program has not yet been implemented (Reference 10).

4.2 Groundwater Targets

Four municipal wells serving North Kansas City are located 0.9 miles west of the site. Eleven municipal wells serving Kansas City, Missouri are located 1.5 miles northwest of the site. Five wells serving Gladstone are located between 2 and 3 miles northwest of the site (Reference 15). An apportioned population of approximately 236,435 people are served by drinking water supplies which draw water from within four miles of the site (References 16, 22, 29, 30-32; 41; Table 2). The Kansas City Missouri municipal water company alone supplies water to more than 30 communities. Twenty-five percent of Kansas City municipal water can be attributed to groundwater wells (References 22; 30).

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4.3 Groundwater Conclusions

No groundwater sampling was conducted for this site. Records were reviewed for the nearest drinking water wells known to be in use near the site. There are five North Kansas City municipal wells located approximately 0.9 miles northwest. Routine analytical testing of the North Kansas City wells in 1993 did not indicate the presence of pesticides, volatile organics (with the exception of chloroform) or commonly used industrial metals such as arsenic, cadmium, chromium, lead, and zinc (Reference 28). No analytical data for base/neutral/acid extractable compounds were located.

The main discharge for the alluvial aquifer is seepage from the aquifer to the Missouri River. Shallow groundwater migration at the site would be limited by the shale unit separating the alluvial aquifer from deeper groundwater (Reference 8, p.1). There is a pump station on-site which serves to prevent sewage from migrating deeper into the subsurface. It is possible that contaminant migration into the subsurface may infiltrate the sewer lines of the municipal sewage system (Reference 27).

Table 2 - Population Served By Groundwater Wells Within Four Miles of the Site

<i>Well Distance from site (miles)</i>	<i>Apportioned Population</i>	<i>Name Municipal Well Owner</i>	<i>Supplies which purchase water from municipalities</i>	<i>Supplies which purchase water¹</i>
0 - 1/4				
1/4 - 1/2				
1/2 - 1	5,000	N. Kansas City		
1 - 2	175,000*	Kansas City		
	4,500*		Belton	
	653*			Cass Co. PWD#2
	52*		Vill. of Birmingham	
	2,288#		Blue Springs	
	515*##		Lathrop	
	4,703**		Lees Summit	
	74**			Cass Co. PWD#3

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Table 2 - Population Served By Groundwater Wells Within Four Miles of the Site				
<i>Well Distance from site (miles)</i>	<i>Apportioned Population</i>	<i>Name Municipal Well Owner</i>	<i>Supplies which purchase water from municipalities</i>	<i>Supplies which purchase water¹</i>
1 - 2	165**			Cass Co. PWD#6
	174**			Jackson Co. PWSD #12&14
	287**			Pleasant Hill
	140*		Northmoor	
	737*		Platte City	
	1,392*		Raymore	
	6,250*		Raytown Water Co.	
	375*		Weatherby Lake	
	763*		Clay Co. PWSD #2	
	600*		Clay Co. PWSD #6	
	300*		Clay Co. PWSD #9	
	1,875&*		Jackson Co. PWD#2	
	5,592*		Jackson Co. PWD#1	
2 - 3	25,000	Gladstone		
3 - 4				
0 - 4	236,435	* - Kansas City PWSD wells supply 25% of total water supply # - Blue Springs gets 55% of their water from Kansas City PWSD		

- For Lathrop, 775 connections x 2.66 people per household in Clinton County = 2,062 people; ** - Lee's Summit gets 33% of their water from Kansas City; & - Jackson County PWSD #2 gets 60% of its water from Kansas City wells.

¹ - These supplies purchase water from supplies that purchase water from municipalities

5. SURFACE WATER PATHWAY

5.1 Hydrologic Setting

The Eisenberg Fill site lies within the Dissected Till Plains of the Central Lowland physiographic province in the Missouri River drainage system (References 14, p.7; 25). The Dissected Till Plains are distinctive in stream development, with broad flood plains and underfit stream channels. The level floodplains are interrupted only by terraces and drainage ditches (Reference 25, p. 21). The Missouri River provides recharge for the alluvial aquifer, most notably during prolonged high river stages (Reference 8, p.1).

Soil erosion is high in the Missouri River basin near Kansas City (Reference 11). Average annual runoff in the Kansas City area is around eight inches (Reference 12, p.22). Streams in the basin generally carry heavy sediment loads and provide poor aquatic habitat. Fishing in the Missouri River in and downstream of the Kansas City area was previously restricted by the Missouri Department of Health due to chlordane contamination in fish (Reference 11).

Water tends to pool on-site during times of heavy rainfall. There are intermittent drainages which run along the northern and western sides of the property; another drainage runs parallel with the railroad tracks, to the southeast, near the pump station. Flow in these drainages was very minimal during the SI2 reconnaissance conducted by MDNR on April 27, 1995 (Reference 13).

Run-off from the site would likely be diverted into these drainage ditches that run along the northern, southern, and eastern perimeters of the site. Although drainage is thought to flow south or southeast, there have been complaints from the grain silo operators north of the site (Figure 1) about water displacement entering the silos when it rains (Reference 18, p.2).

Site drainage is thought to flow southeast, to enter either a stormwater sewer or follow an overland channel, to empty into the Missouri River. The shortest distance from the site to the Missouri River is about 1.5 miles. The probable point of entry (PPE) for the surface water pathway starts between Missouri River miles 362 and 363. The 15-mile target distance limit ends at the SE $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Section 25, T51N, R31W/R30W near Atherton, Missouri (Reference 4).

According to a flood hazard boundary map, this location is considered to be an area of minimal flood hazards, as it is protected by a levee (References 4; 24). No karst areas were noted near the site (Reference 14, p.34).

5.2 Surface Water Targets

The Missouri River is state-designated for irrigation, livestock and wildlife watering, protection of warm water aquatic-life and human health - fish consumption, boating, drinking water supply, and industrial use (Reference 33). In 1993, the commercial fish harvest from the segment of the Missouri River bordering Clay and Jackson counties was 2,138 pounds of fish (Reference 42, fig.1).

There are no known drinking water intakes within 15 downstream miles of the site (References 14; 15). Kansas City, Kansas obtains drinking water from an intake on the Missouri River upstream of the site (Reference 31).

Sensitive environments are present in the Missouri River. The federally-endangered bald eagle (*Haliaeetus leucocephalus*) is found roosting in tall trees and cliffs along the Missouri River during the winter months. The federally-endangered pallid sturgeon (*Scaphirhynchus albus*) is known to inhabit the Missouri River. The pallid sturgeon favors shallow areas around islands and sand bars (Reference 36, p. 1).

Wetland areas are present on both banks of the Missouri River along the 15-mile surface water pathway. The nearest northern riverbank wetland, downstream from the PPE, accounts for 2 miles of wetland frontage. The nearest southern riverbank wetland, which includes Riverfront Park, accounts for 11.75 miles of contiguous wetland frontage (Reference 43).

The sicklefin chub (*Macrhybopsis meeki*) and floating foxtail grass (*Alopecurus aequalis*) are known historically from the area. Floating foxtail grass, state-listed Rare, was identified 10 miles downstream of the site in 1985. The sicklefin chub, a candidate for federal listing and state-listed Rare, was found 12 miles downstream of the probable point of entry in 1945 (References 39 and 40). Due to the age of these sightings, these species may not meet the definition of sensitive environments as per the HRS (Reference 1).

5.3 Surface Water Sampling Locations

Surface water samples were collected from two intermittent drainages. The sample collected from the pooled water area near the highway exit ramp (95-0641), off-site to the southwest, was collected as background. Sample 95-0639 was collected off-site to the southeast, from the intermittent drainage near the pumphouse. This location is thought to be downgradient (Reference 44; Appendix A).

5.4 Surface Water Analytical Results

Surface water analytical results are presented as Table 3A. Both samples collected from intermittent drainages near the site were found to contain barium, chromium, and bis-2-ethylhexylphthalate. The upgradient sediment sample, considered to be background, also contained di-n-butylphthalate (Reference 44).

Values were higher for all parameters in the sample considered to be background, or upgradient. As stated earlier, this location may be adversely affected by its proximity to the highway. However, it reflects the off-site conditions found in this industrial location.

5.5 Sediment Sampling Results

Sediment samples were collected at the same locations as the surface water samples, from the intermittent drainages located southwest and southeast of the site. The sediment samples showed a marked contrast to the surface water samples. Eight semi-volatile compounds (0.15 - 6.1 ppm) and arsenic (12 ppm), parameters that were non-detect in the upgradient sample, were detected in the sediment sample from the pumphouse. The downgradient sample also detected elevated levels of cadmium (11.9 ppm), lead (743 ppm), and selenium (2.94 ppm) (Reference 44).

The following base-neutral compounds, not detected in the sample near the pumphouse, were found in the background sample: bis(2-ethylhexyl)phthalate (570 ppm) and di-n-octylphthalate (180 ppm) (Reference 44).

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Table 3A

MISSOURI DEPARTMENT OF NATURAL RESOURCES SITE INSPECTION SAMPLING - EISENBERG FILL SITE - INTERMITTENT SURFACE WATER RESULTS All values in parts per billion (ppb); samples collected April 27, 1995 Shaded values show actual contamination**; values in bold exceed an applicable SCDM benchmark				
PARAMETER	Sample Number and Type			
Samples analyzed for total metals and BNAs <i>* trip blank analyzed for BNAs only</i>	95-0639 off-site to southeast water grab	95-0641 off-site to southwest water grab <i>background</i>	95-0645 trip blank water	SCDM Environmental Benchmark - Surface Water
Barium, total	24.4	56.9	NA*	---
Chromium, total	7.32	20.2	NA*	210
Di-n-butylphthalate	ND	0.86	ND	---
Bis(2-ethyl-hexyl)phthalate	2.5	30.0	ND	---
** - Values are 3X background or exceed background where background is non-detect (ND)				

5.6 Surface Water Conclusions

As samples were collected from an intermittent portion of the surface water pathway, the elevated levels of contamination detected in the sediment samples does not constitute an observed release to this pathway. One form of contamination (primarily phthalates, barium, and chromium) is reflected at the southwestern intermittent drainage, thought to be upgradient of the site; while another type of contamination (base-neutrals, arsenic, lead, selenium, and cadmium) is reflected in the other off-site drainage, thought to be downgradient.

It is interesting to note that the original sample of pooled water EPA collected from the site in 1988, while recorded as inconclusive for semi-volatiles, did detect a series of phthalate esters at concentrations of 50-200 ppb. It was assumed that this was due to the sampling vial (which was plastic) not being Teflon lined (Reference 9). It is possible that the

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Table 3B

MISSOURI DEPARTMENT OF NATURAL RESOURCES SITE INSPECTION SAMPLING FOR EISENBERG FILL SITE- SEDIMENT RESULTS (0-2 foot depth) Samples collected April 27, 1995; All samples in parts per million (ppm) Shaded values show actual contamination*; There are no SCDM benchmarks for sediment		
PARAMETER	SAMPLE NUMBER AND TYPE	
Samples analyzed for total metals and BNAs	95-0642 Sediment grab, ditch near exit ramp southwest of site; Background	95-0643 Sediment grab, ditch at pumphouse - southeast of site
Arsenic, total	ND	12
Barium, total	204	311
Cadmium, total	3.56	11.9
Chromium, total	48.2	108
Lead, total	167	743
Selenium, total	0.531	2.94
Vanadium, total	163	123
Acenaphthene	ND	0.15
Phenanthrene	ND	4.8
Anthracene	ND	1.2
Fluoranthene	ND	6.1
Pyrene	ND	4.7
Bis(2-ethylhexyl)phthalate	570	ND
Butylbenzylphthalate	ND	1.1
Benzo(a)anthracene	ND	2.1
Chrysene	ND	2.8
Di-n-Octylphthalate	180	ND
* Values exceed background(if background is non-detect (ND)) or are 3X background		

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contamination found to the southwest of the site (SI2 background) actually reflects the historical dumping which has occurred in this area, while the sample collected to the southeast of the site (SI2 downgradient) reflects more recent dumping events.

As surface water drainage from the site is normally intermittent, it is difficult to tell how pooled water drains from the site. It is possible that surface water entering the shallow subsurface is channeled by the sewer lines of the 19th Avenue pumping station into the municipal sewage system (Reference 27).

6. SOIL EXPOSURE AND AIR PATHWAYS

6.1 Physical Conditions

The Eisenberg property is a 30-acre parcel located in a low-lying portion of North Kansas City, approximately 1.5 miles north of the Missouri River. The surrounding area is predominantly industrial. Grain silos are located both northeast and southeast of the site; the Burlington Northern railyard is directly southeast, past the 19th Avenue Pumping Station. The site is bounded on the northwest by Interstate-35, the southwest by 16th Street (Reference 4; Figure 1).

The Missouri River floodplain in this area, including the Eisenberg Fill site, has a flat to gently undulating topography, sloping 0-2% to the south (Reference 17, p.1). The 10-acre portion of the Eisenberg property leased by Mo-Kan Container Service is covered with truck/rail containers. The 20 acres of Eisenberg property to the northeast of Mo-Kan is an open lot, partially covered by sparse vegetation. During the MDNR SI2 site reconnaissance on June 27, 1995, thick grasses and trees were noted along the northwestern perimeter of the property, adjacent to an intermittent surface water drainage (Reference 13).

Piles of grayish fill are evident across the vacant 20 acres of the site, in contrast to the tan soils observed over most of the site surface. A fire extinguisher, caution tape and what appeared to be a gas mask were found near the center of the vacant lot during the site visit (Reference 13, photo #46-12A).

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During an MDNR SI1 site visit in 1989, it was estimated that at least 10 feet of fill material had been introduced to the Eisenberg property. The fill material was composed of concrete, brick, iron, rebar, and fine-grained soil. At least three feet of fill has been added since that time (Reference 13).

About three feet of colluvial or glacial silty clay and clay underlie the fill material (Reference 8, p.1). Topsoil is a dark brown silty clay loam, approximately two feet thick with moderate to low permeability (Reference 17; p.2). Leta silty clay and Levasy silty clay are prevalent in this area. Both soil types are considered to be unsuitable for building development or on-site waste disposal due to wetness, occasional flooding, and ponding (Reference 23, p.48-49).

6.2 Soil and Air Targets

There are no residential areas within 200 feet of Eisenberg property. The nearest residence is a condominium development to the northwest of the intersection of I-35 and Armour Road, 0.1 miles northwest of the site. A trailer is set up as a check-in area near the entrance to the property. Site access is expected to be limited to the four permanent employees of Mo-Kan Container Service and their customers. As many as 100 trucking companies may visit the site in a day to rent containers (References 4; 13).

Approximately 76,169 people live within four miles of the site. About 71,459 people were attributable to Missouri; 4710 people to Kansas. The Kansas population was calculated as follows. Approximately 3.39 square miles of the four mile distance ring fell in Kansas City, Kansas. The average population per square mile in Kansas City Kansas in 1990 was 1,389.3 people. This equates to approximately 1570 people apportioned to the 2-3 mile distance ring and 3140 people to the 3-4 mile distance ring. The Missouri population was estimated using 1990 census tract block information (Reference 34).

Table 4

Residential Population Within Four Mile Radius of Site		
<i>Distance</i>	<i>Population</i>	<i>References</i>
on-site	0	4,13
0 - 1/2	1,368	4,34
1/2 - 1	2,737	34
1 - 2	5,365	34
2 - 3	23,074	34,35
3 - 4	43,625	34,35
0 - 4	76,169	

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Within a four-mile radius, there are a significant number of wetland areas located along the Missouri River. The most notable areas are as follows:

- ▶ Riverfront Park, on the southern bank of the Missouri River, is located approximately 1 mile from the site. Roughly 250 acres of wetland frontage are associated with this park (Reference 43).
- ▶ There is a wetland of roughly 150 acres located from 1.5 to 3 miles southwest of the site (Reference 43). This wetland is also listed as a notable natural area (Reference 39).

The state-designated Rare species Goldie's Fern (*Dryopteris Goldiana*) is located within the 3-4 mile distance ring in the Hidden Valley city park and associated natural area (Reference 37). The Hidden Valley Natural Area is an 82-acre upland mesic forest (Reference 38). There is also a four-acre mesic forest located 1-2 miles from the site (Reference 39).

6.3 Soil Sampling Locations

Two grab samples of fill were collected from the Mo-Kan portion of the property, toward the southeast border, which was the location of the pooled waste noted in the initial EPA sampling of 1988. A soil grab sample was collected from a location just east of the I-35 exit ramp at 16th Street, for background. A sample of the waste piles observed on-site was collected from a representative pile located near the southern boundary of the vacant portion of the Eisenberg property (Reference 44). This sample was previously discussed in detail in Section 3, Waste/Source Sampling.

6.4 Soil Analytical Results

The westernmost sample of fill collected from the Mo-Kan property, 95-0637, was similar in composition to the background sample, 95-0640. No metals were detected in sample 95-0637 at levels greater than the background sample. Fluoranthene (0.58 ppm) and pyrene (0.53 ppm) were detected at levels greater than three times background (0.1 ppm fluoranthene, 0.073 ppm pyrene) (Reference 44).

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The sample collected further east, 95-0638, had the following substances at levels greater than three times background: cadmium (4.06 ppm), total lead (132 ppm), fluoranthene (21 ppm), and pyrene (9.8 ppm). The following parameters were also present at levels ranging from 0.12 ppm to 13 ppm: acenaphthene, phenol, dibenzofuran, fluorene, phenanthrene, anthracene, benzo(a)anthracene. These compounds were not present in the background sample (Reference 44; Table 5).

Arsenic was detected across most of the site at levels (3.29 ppm - 10.5 ppm) which exceed the SCDM reference value of 0.33 ppm for arsenic. The highest level was detected from the background sample (Reference 44).

6.5 Soil Exposure and Air Pathway Conclusions

An observed release of contamination to the soil pathway was not documented by analytical sampling, as samples collected on-site were not native soil. However, actual contamination of fill material on-site has been documented by analytical sampling (Reference 44).

Elevated levels of semi-volatile compounds were detected across the site. The highest levels of metal contamination were found in the easternmost fill sample collected from the Mo-Kan rental property (elevated levels of lead and cadmium) and a pile of gray sludge-like material (elevated selenium) found near the southern boundary of the vacant portion of the site (Reference 44).

Potential exposure to on-site contaminants may be a concern for the worker population of the Mo-Kan Container Service and their customers. The nearest residential population is over 200 feet to the northwest of the site, across the I-35 exchange with Armour Road (Reference 13). The population within 0.5 miles of the site is approximately 1,368 people; within four miles, 76,169 (Reference 37). The affected population may be greater, as the area of contamination has been documented to extend beyond the boundaries of the 10 acres of Eisenberg property rented by Mo-Kan Container Service and may include the entire 30 acres.

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Table 5

MISSOURI DEPARTMENT OF NATURAL RESOURCES SITE INSPECTION SAMPLING EISENBERG FILL SITE - SURFICIAL SOIL RESULTS (0-2 foot depth) Samples collected April 27, 1995; All samples in parts per million (ppm) Values in bold show actual contamination*; shaded values exceed an applicable SCDM benchmark					
PARAMETER	Sample Number and Type				
Samples analyzed for total metals and BNAs	SCDM Reference Value	95-0637 Soil grab, hole #1, Mo-Kan fill	95-0638 Soil grab, hole #2, Mo-Kan fill	95-0640 Soil grab, Exit ramp BKGD	95-0644 "Soil" grab, north side of Mo-Kan fill; suspected source
Arsenic, total	0.33	3.29	ND	10.5	6.18
Barium, total	41,000	98.8	224	241	25.9
Cadmium, total	290	ND	4.06	1.03	ND
Chromium, total	2,900	10.2	30.9	19.8	33.5
Lead, total	—	18.3	132	32.5	14.3
Selenium, total	2,900	ND	ND	ND	2.79
Vanadium, total	4,100	61.5	125	142	209
Acenaphthene	35,000	ND	0.620	ND	ND
Naphthalene	—	ND	ND	ND	0.035
Phenol	350,000	ND	0.120	ND	ND
2-Methylnaphthalene	—	ND	ND	ND	0.082
Dibenzofuran	—	ND	0.930	ND	0.024
Fluorene	23,000	ND	1.0	ND	ND
Phenanthrene	—	ND	13	ND	0.086
Anthracene	170,000	ND	5.1	ND	ND
Fluoranthene	23,000	0.58	21	0.1	ND
Pyrene	17,000	0.53	9.8	0.073	ND
Benzo(a)anthracene	—	ND	6.9	ND	ND
* - exceed background (if background is non-detect (ND) or are 3X background)					

7. SUMMARY AND CONCLUSIONS

Summary

The Eisenberg property is an undeveloped 30-acre tract of land located on the northeastern quadrant of the intersection of Interstate-35 and 16th street in industrialized North Kansas City, Missouri. The southwestern 10 acres of the property, currently leased to Mo-Kan Container Service, was the focus of previous Eisenberg Fill Superfund site investigations. The findings of this SI2 report indicate that the entire Eisenberg property has been used for unauthorized dumping.

EPA received a complaint regarding the Eisenberg Fill site in 1988. Several pools of a black liquid were reportedly oozing from a fill area near the intersection of 16th Street and Interstate 35. A subsequent investigation by EPA revealed three pools of dark stained water, each approximately 50 square feet in size, at the northeastern corner of what is now Mo-Kan rental property. A sample of the pooled water was collected by EPA on April 6, 1988 and was found to contain elevated levels of vanadium and arsenic. Subsequent investigation by MDNR, in 1989, confirmed previous results. Levels of benzo(a)pyrene were also detected in on-site soils in excess of Superfund site screening standards.

SI2 sampling conducted in April 1995 indicates that the contamination of this property extends beyond the 10 acres of Mo-Kan rental property and includes portions of the 20 acre vacant lot. On-site samples were found to contain elevated levels of semi-volatile compounds and several metals, demonstrating actual contamination. However, no values were found to exceed SCDM values, with the exception of arsenic, which was detected in the background sample. There is difficulty in obtaining a true background sample near the site, due to the industrial nature of the area.

The Missouri River alluvium is the major aquifer in northwestern Missouri (Reference 8, p.2; 10, p.1). Twenty municipal wells are located within three miles of the site, representing over 230,000 people relying upon groundwater for their drinking water within a four-mile radius. The dominant regional groundwater flow direction is toward the south, but the direction in the alluvial aquifer may vary, depending upon the magnitude of flow in the Missouri River (Reference 8, p.1). During flooding or exceptionally high river stages, the river can recharge the aquifer and redirect the flow eastward (Reference 17, p.1).

Sampling of groundwater was not conducted as a part of the SI2 (Reference 44). The nearest wells to the site, the municipal wells for North Kansas City, are located 0.9 miles

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to the northwest (Reference 15). Routine analytical testing of these wells in 1993 did not indicate a release of hazardous substances to the shallow aquifer (Reference 28).

Water tends to pool on-site, as the property is located in a low-lying portion of the Missouri River floodplain. Intermittent drainages run along the northern and western sides of the property (Reference 13). Samples collected from the sediment and surface water contained in these drainages indicates that hazardous substances may be migrating into the surface water pathway. However, since the samples were not collected from permanently flowing surface water, an observed release to the surface water pathway has not been documented.

Run-off from the site would likely be diverted into the sewer system or overland drainage ditches. Drainage from the site ultimately empties into the permanently-flowing Missouri River, approximately 1.5 miles south of the site. The Missouri River is utilized as a fishery and may support two federally-endangered species in this area. Over twenty miles of wetland frontage is represented along the 15 miles of Missouri River downstream of the site. The nearest southern riverbank wetland accounts for 11.75 miles of contiguous wetland frontage and is over 250 acres in size (Reference 43).

There are no residential areas within 200 feet of Eisenberg property. The nearest residence is a condominium development 0.1 miles northwest of the site. A trailer is set up as a check-in area near the entrance to the property. Site access is expected to be limited to the four permanent employees of Mo-Kan Container Service and their customers (References 4; 13). The contaminated fill at the site may pose a threat of exposure to hazardous substances for the employees of Mo-Kan Container Service and their customers (References 44).

Conclusions

The Eisenberg Fill site appears to have been used as an unregulated fill area for at least seven years, with dumping continuing on-site today. Several of the metals associated with the site - arsenic, cadmium, and selenium - are associated with copper refining or smelting. Due to the continued use of the property as an unregulated fill area, additional action is recommended for this site.

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Appendix A

SITE INSPECTION SAMPLING RATIONALE EISENBERG FILL SITE April 27, 1995		
Sample Number	Sample Type (grab)	Location and Objectives All soil samples collected from a depth of 0-2 feet
95-0637	Soil	Fill at Mo-Kan rental property, hole #1; sample to determine on-site conditions
95-0638	Soil	Fill at Mo-Kan rental property, hole #2; sample to determine on-site conditions
95-0639	Surface water	Drainage ditch at pumphouse; sample to show condition of surface water leaving southeastern side of site
95-0640	Soil	Soil near highway exit ramp, <i>background</i>
95-0641	Surface water	Drainage ditch near highway exit ramp; sample to show condition of surface water upgradient (southwest) of site, <i>background</i>
95-0642	Sediment	Drainage ditch near highway exit ramp; sample to show condition of sediment upgradient (southwest) of site, <i>background</i>
95-0643	Sediment	Drainage ditch at pumphouse; sample to show condition of sediment on southeastern side of site
95-0644	Soil grab	Fill material on north side of Mo-Kan area; soil sample to determine contents of suspected source
95-0645	Water grab	Trip blank

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